GameTale: Facilitating the Design of Gameful Museum Experiences

Daniela De Angeli
University of Bath
D.de.Angeli@bath.ac.uk
07827120292

Introduction

The rapid development of digital technologies is affecting the way people live, communicate and pass their leisure time (Greenfield, 2014; Siemens, 2014). Thus, contemporary museums are competing for people's attention with a variety of digital entertainment options. Visitors are looking for experiences that are not only educative and authentic, but also entertaining and more interactive experience than the traditional visit, to be active authors rather than just passive observers (Tallon and Walker, 2008). Thus, museums are pressured into designing experiences that are more interactive and digital. However, most museums are still faithful to the traditional object-centered approach that leads to a passive experience, which is not what most visitors wish for.

Digital technologies offer new opportunities to engage the public with active and interactive experiences. In particular, digital games are gaining reach in entertainment, popular culture, and as an academic field of study (Seaborn and Fels, 2015). Following the popularity of games, marketing and customer services have appropriated game elements and affordances in order to enhance users' engagement to hold users' attention (Hamari et al., 2014). Such affordances include for instance points, achievements/badges, levels, rewards, challenges and story/theme (Hamari et al., 2014). Deterding et al. (2011) defines the use of game design elements in non-game contexts as gamification. Given that "game design is the practice of creating enjoyable interactions, it stands to reason that it holds something of interest to any domain in where interaction is designed and the goal is to make it more enjoyable" (Walz and Deterding, 2015, p. 9).

Deterding et al. (2011) emphasize that gamification is used to implement gameful experiences. Gameful experiences provide the same psychological experiences as games and enhance user's overall value creation using affordances (Huotari and Hamari, 2012). Despite their growing popularity, the use of gameful experiences in museums is still very limited. Museums have been using games mainly for educational purposes. However, games can be much more than an educational tool and museums have the potential to be gameful, to *provide visitors with emotional and psychological experiences similar to games, using game-based activities and affordances (e.g. achievements, challenges and narrative) to stimulate participation, creativity, curiosity and perseverance*.

However, museum often struggle to balance their traditional rigour with the requirements of a changing society (Falk and Dierking, 2000). For example, it is not completely clear whether virtual experiences can positively support the experience or instead distract from the artefacts and the real experience (De Angeli and O'Neill, 2015; Falk and Dierking, 2000). Moreover, museums are often worried about focusing too much on entertaining, losing their perceived authority and becoming mere entertainment parks (Wolf et al., 2007). Museum professionals are often the main barriers to the introduction of digital technologies. Museum professionals' skepticism is mainly due to a lack of technical skills and a long-standing experience with the

design of passive object-centered exhibitions. Nevertheless, contemporary museums have the potential and the mission to present knowledge in authoritative yet enjoyable ways (Murphy, 2007).

Thus, it is increasingly essential for museums to understand visitors and how they interact with the artefacts in order to design narratives that are more engaging and relevant (Galani, A., Maxwell, D., Mazel, A., & Sharpe, 2011; Hansen et al., 2012; Simon, 2016). Participatory practices such as collaborative workshops have been deployed as a method to understand visitors' needs, requirements and expectations (Roussou et al., 2015). By involving visitors directly in the design process, the museum allow people to create their own meaning (Chatham et al., 2013), fostering engagement (both individual and social) (Deen et al., 2014), and involvement (Simon, 2016). This is the premise for the creation of GameTale, an event during which members of the public were invited to design games around museum artefacts[1]. GameTale provides a better understanding of how artefacts can be interpreted and shared via digital technologies while maintaining historical accuracy.

Table 1: Location (i.e. venue), duration, theme (i.e. museum artefact/s), number of participants, and outcomes (i.e. games developed) of GameTale (GT) in 2016, 2017 and 2018

	GT 2016	**GT 2017**	**GT 2018**
Venue	University of Bath	University of Bath	Holburne Museum
Duration	3 days	4 days	2 days
Theme	One or more artifacts chosen among 5	One artifact chosen among 3	One specific artifact (participants have not choice)
Participants	26	13	11
Outcomes	9 games developed, 7 full prototypes, none of which informed new museum experiences	5 games developed, 2 full prototypes that informed new museum experiences	4 games developed, 1 full prototype that informed a new museum experience

Game Jams and Museums: The Case of GameTale

GameTale is a game jam, an event where games are developed in a short timeframe and following given design constraint(s) (Kultima, 2015). The first reported Game Jam was organized in 2002 (Kultima, 2015). Since then, GJs have grown in number and kind. For example, the GGJ went from 1600 participants in 2009 to 6500 participants in 2011 (Preston et al., 2012). During this timeframe, GJs have evolved a set of common rules (Fowler et al., 2013; Kultima, 2015; Musil et al., 2010). For example, GJs have a limited timeframe, which means participants need to prototype rapidly, generally within 48 hours. The Global Game Jam (GGJ) suggests that this brief timeframe encourage creative thinking[2]. Moreover, games should also have a

[1] *https://gametale.org/*
[2] http://globalgamejam.org/faq

thematic constraint, which means participants cannot develop just any old game. For GameTale this constraint is given by the fact that games are developed around one or more museum artefacts. Anybody can participate as a "jammer" although small teams are encouraged. At the end the results should be shared, e.g. online and/or through public presentations. Indeed, GameTale includes both a jam part when participants make games and a showcase part when games are displayed to the public.

While in the last five years game jams have been introduced in museums, their use has been limited. Institutions have used game jams mainly as an educational tool. For example, in 2015 Milan's Museo della Scienza e della Tecnologia hosted JamToday, a game jam focused on the development of serious games to improve teaching and learning (Crombie et al., 2015). Game jams are particularly effective at teaching new skills because participants learn through practical experience (Fowler et al., 2013) and they attract people from different backgrounds, including novices and students who are passionate about games but have just started learning how to design (Scott and Ghinea, 2013). Moreover, game jams have been used to involve visitors with museum collections (Mader, 2015). For example, National Museums Scotland organized a game jam to engage young visitors with museums' collections in new and exciting ways[3]. However, the purpose of GameTale is not only to educate or involve visitors with the museum collection. GameTale aims to facilitate the design of gameful experiences that are both engaging and historically accurate. Through GameTale, the public is directly involved in the design of games around museum artefacts. Museums are also involved in the process are they select the artefacts and provide historically accurate information about them.

Facilitating the Design of Gameful Experiences Through Game Jams

GameTale was carried out and reviewed for three consecutive years in order to refine its design and better fit its purpose. The first GT was organised in 2016, followed by other two events in 2017 and 2018. Each edition differed for some aspects such as the number of artifacts offered (Table 1 and 2). This iterative process provided a better understanding of how a game jam can be organized to facilitate the design of experiences that are both gameful and historically accurate.

Firstly, number of participants and location did not influence the quality of games developed and their historical accuracy. The game jam does not need to be hosted within the museum itself but can be organized in any **location** with WiFi and wall sockets. GameTale is held every year in Bath**,** a UNESCO World Heritage site in in South West England. In 2016 and 2017 participants developed games at the University of Bath while in 2018 GameTale was organized at the Holburne Museum in Bath, UK. However, in 2018 only one game was based on historical facts related to the peacock. Similarly to previous years, participants included the artifact as a game

[3] https://igdascotland.org/2015/09/national-museums-scotland-game-jam-project-opportunity/

component, developing games that were either abstract or unrelated to the history of the artefact. Moreover, the game jam can be a small-scale event with 10-15 **participants**. Registration to GameTale (GT) is free and open to any adult at least 18 years old. However, the number of participants is restricted every year depending by the size of the venue and the number of volunteer available. In 2016 GameTale had 26 participants, 9 female and 17 male, split in 9 teams. The following years the number of participants was reduced. In 2017 GameTale had 13 participants, 3 females and 10 males, split in 5 teams. In 2018 GameTale the number of participants was reduced to 11, 3 females and 8 males, split in 4 teams. However, the number of participants did not influence the quality of games developed. Outcomes were rather influenced by time and thematic constraints.

Game jams usually have a short **timeframe** varying from 24 to 72 hours. However, participants of GameTale had a hard time to complete their prototypes in less than 2 days. In 2018 participants had 1 day and half to develop their games, while the remaining half-day visitors could walk around and play test the games. Opening the doors to the public was distracting to some participants and interrupted the creative flow. Ultimately, participants had not enough time to complete the games and only one team was able to present a playable demo. However, providing too much time can be counter-productive. For example, in 2017 GameTale lasted 4 days: 2 days of game jam, 1 day and half to finalise the games at home and half day for the showcase. Nonetheless, 2 out of 5 prototypes were finalised. Therefore, the ideal length of the game jam appears to be 2 days like in 2016 when 7 out of 9 prototypes were finished.

During game jams, games are usually developed following a **thematic constraint** (Kultima, 2015). Participants of GameTale should also have a thematic constraint as well, which is to develop their games around an artefact. Games should focus only on one artefact. In 2016 GameTale offered 5 artifacts (Table 2). Participants could develop any kind of game around one or more of these objects. However, only one game took into account the historical and cultural background of the artifact: game 6 (Table 3). Game 6 was developed around the leopard with drum, an artefact originally from Coastal Gahna. The game reproduced the dynamics of African tribes with their royal animals. Unfortunately, the game was not completed and did not inform a new museum experience. None of the 9 games developed during GameTale 2016 become a permanent visitors' experience. While some games resulted particularly engaging during the showcase, the artifacts were usually included as a game component without historical context. For example, game 3 and 9 resulted particularly challenging and thus engaging. However, the games resulted too challenging and the brooch was used only as a collectible (Table 3).

In 2017 three artifacts were offered but participants could develop the game around only one of them. As a result, 3 out 5 games developed were inspired directly to the historical-cultural background of the artifacts: game 1, 2, and 5 (Table 4). However, only the prototypes of game 1 and 2 were completed and ended up

informing new visitors' experiences. Game 1 was developed around the death mask and included quizzes connected to Sir Isaac Pitman such as languages quizzes. The game is being translated into an immersive experience at the University of Bath. Game 2 was developed around the netsuke figurine and follows one of the tales of the badger teakettle. The game will be published in the website of the Holburne Museum. Game 5 is based on another version of the same tale of the badger tea-kettle where the badger shift form in order to hide. Unfortunately, game 5 was not completed.

Finally, in 2018 participants could not choose among artefacts but had to design their games around a specific object. At the end, 4 games were developed but only the prototype of game 1 was completed and is currently informing a new visitor experience at the Holburne museum (Table 4). Game 1 was also the only game including historical and cultural information regarding the peacock. It is an Augmented Reality (AR) game that uses a photo of the peacock as a target image to display the 3D model of the artefact. Players then have to collect items hidden around the 3D model to uncover information regarding the peacock. The game is being translated into an interactive experience where visitors of the Holburne Museum will be able to use their mobile devices to visually augment the steel peacock on display and discover new information in a gameful way, collecting items hidden in the statue.

Table 2: List of artefacts offered each year at GameTale (GT)

GT 2016	**GT 2017**	**GT 2018**
Delft ceramic urn made in 1690. Property of the National Trust UK	Palladian Bridge built in 1755 at Prior Park Landscape Garden in Bath	Steel peacock originally from Iran, probably Isfahan, made in the late 19th century. Holburne museum collection
19th century sculpture comprising a leopard and a drum originally for Coastal Gahna. Property of the Bath Royal Literary and Scientific Institution (BRLSI)	Netsuke figurine carved in Japan in the 19th century displaying 'The Legend of the Badger Tea Kettle', which is a common theme in Japanese folktales. Property of the Holburne museum	
Romano-British bronze brooch made during the 1st or 2nd century CE. Property of BRLSI	Death mask of Sir Isaac Pitman, a teacher that developed the most widely used system of shorthand. Part of the Library Collection of the University of Bath	
Tooth of an ichthyosaur - an extinct marine reptile - about 190 million years old. Property of BRLSI		
Complete skull of Pelagosaurus typus, a group of marine crocodylomorphs from the Early Jurassic to the Early Cretaceous. Property of BRLSI		

Table 3: List of games developed during GT 2016. The table indicates the type of game, the artefact/s included in each game, and the general purpose of each game

1	Text-based web game	All 5 artefacts	Players need to solve a set of quests per each artefact to complete the game and 'escape' a virtual room
2	Board game	All 5 artefacts	Players need either to steal or defend artefact in the house of a private collectors
3	3D Videogame	Brooch	Players need to collect brooches jumping between platforms
4	3D Videogame	Brooch	Players need to rotate the brooch in order to recover its lost gems
5	Mixed Reality Game	All 5 artefacts	Players are either smuggler or archaeologists who need to find the artefacts
6	3D Videogame	Leopard with drum	A strategy game where players are African tribes trying to collect land
7	2D Videogame	All 5 artefacts	Players explore a set of rooms to find artefacts while avoiding monsters
8	2D Videogame	Pelagosaurus skull	Players are a Pelagosaurus trying to collect food while avoiding obstacles
9	3D Videogame	Brooch	Players need to jump up a long flight of stairs without fall in order to collect the brooch

Table 4: List of games developed during GT 2017. The table indicates the type of game, the artefact/s included in each game, and the general purpose of each game

1	3D videogame	Death Mask	Players have to solve puzzles connected to Sir Isaac Pitman to escape a virtual room
2	2D videogame	Netsuke Figurine	Players explore a Japanese village and find a magic badge, learning about the Legend of the Badger Tea Kettle
3	3D Videogame	Palladian bridge	Players need to cross bridges in order to solve a mystery
4	2D videogame	Netsuke Figurine	Players have a cursed mask and need to collect a set of items to get ride of it
5	3D videogame	Netsuke Figurine	Players are a badger who is trying to hide and shift to avoid being discovered before reaching his destination

Table 5: List of games developed during GT 2018. The table indicates the type of game, the artefact included in each game (i.e. the peacock, which was the only artifact offered in 2018), and the general purpose of each game

1	AR game	Peacock	Players scan a photo of the peacock with a mobile device. Players have to collect items hidden in the 3D model of the peacock that appears on-screen. By collecting these items, players gain information regarding the peacock
2	3D videogame	Peacock	Players are a peacock trying to collect items while escaping from a tiger
3	3D Videogame	Peacock	Players control the God of War who lost his peacock and is trying to find his way through a maze to get it back
4	3D videogame	Peacock	Players are peacocks solving puzzles to find a treasure

Conclusion

GameTale is a game jam, an event during which participants gather for a short timeframe to develop games around a theme. The purpose of GameTale is to facilitate the design of gameful experiences around museum artefacts. In order to achieve this purpose, games should be developed given two main constraints: time and theme. GameTale was carried out and reviewed for three consecutive years: 2016, 2017, and 2018. Through this iterative process, different timeframes and thematic constraints were tested. As a result, the suggested length for a game jam is two days while the games could be showcased to the public either online or on-site (e.g. in a museum) the third day. Moreover, the game should be developed around one – and only one – artefact. A choice can be given to participants regarding which object, but the game should focus on one artefact and its history. In 2016 and 2017 participants choose the artefact the first day of GameTale. In 2018 participants had not choice as only one artefact was offered as a theme. In 2019 participants will instead vote their favorite artefact from a list, before the event. The object receiving more votes will be chosen as a theme for GameTale 2019. This further iteration will add a layer of participation because museums will still propose a list of artefacts but participants will choose themselves the theme before the beginning of the game jam.

Abstract

Digital technologies – games in particular - are offering museums new opportunities to engage the public with active and interactive experiences. Visitors are looking for experiences that are not only educative but also entertaining and more interactive than the traditional passive visit. While museums are pressured into designing experiences that are more interactive and digital, they are yet faithful to the traditional passive experience and are struggling to adapt to the new requirements. Thus, a game jam named GameTale was organized to facilitate museums with the design of new experiences that are emotionally and psychologically similar to games (i.e. gameful experiences). In order to achieve this purpose, participants should be given two main constraints: a short timeframe (i.e. 2 days) and a theme (i.e. develop the game around a specific artefact).

Keywords

Game jam, gameful, gametale

References

Chatham, A., Schouten, B.A.M., Toprak, C., Mueller, F., Deen, M., Bernhaupt, R., Khot, R., Pijnappel, S., 2013. Game jam, in: Extended Abstracts on Human Factors

in Computing Systems on - CHI EA '13. ACM Press, New York, New York, USA, p. 3175. doi:10.1145/2468356.2479640

Crombie, D., Wijnen, V., Renger, W.-J., Mersh, P., 2015. The JamToday Network: Towards Applied Games for Learning environment, in: ECGBL2015-9th European Conference on Games Based Learning. pp. 152–160.

Deen, M., Cercos, R., Chatman, A., Naseem, A., Bernhaupt, R., Fowler, A., Schouten, B., Mueller, F., 2014. Game jam, in: Proceedings of the Extended Abstracts of the 32nd Annual ACM Conference on Human Factors in Computing Systems - CHI EA '14. ACM Press, New York, New York, USA, pp. 25–28. doi:10.1145/2559206.2559225

Deterding, S., Sicart, M., Nacke, L., O'Hara, K., Dixon, D., 2011. Gamification. using game-design elements in non-gaming contexts, in: Proceedings of the 2011 Annual Conference Extended Abstracts on Human Factors in Computing Systems - CHI EA '11. ACM Press, New York, New York, USA, p. 2425. doi:10.1145/1979742.1979575

Falk, J.H., Dierking, L.D., 2000. Learning from museums: Visitor experiences and the making of meaning, American Association for State and Local History Book Series. Rowman & Littlefield.

Fowler, A., Khosmood, F., Arya, A., 2013. The Evolution and Significance of the Global Game Jam [WWW Document]. Proc. 8th Int. Conf. Found. Digit. Games.

Galani, A., Maxwell, D., Mazel, A., & Sharpe, K., 2011. Situating Cultural Technologies Outdoors: Design Methods for Mobile Interpretation of Rock Art in Rural Britain, in: J. Trant & D. Bearman (Ed.), Museums and the Web 2011: Proceedings. Toronto.

Greenfield, S., 2014. Mind change : how digital technologies are leaving their mark on our brains.

Hamari, J., Koivisto, J., Sarsa, H., 2014. Does Gamification Work? -- A Literature Review of Empirical Studies on Gamification, in: 2014 47th Hawaii International Conference on System Sciences. IEEE, pp. 3025–3034. doi:10.1109/HICSS.2014.377

Hansen, F.A., Kortbek, K.J., Grønbæk, K., 2012. Mobile Urban Drama: interactive storytelling in real world environments. New Rev. Hypermedia Multimed. 18, 63–89. doi:10.1080/13614568.2012.617842

Huotari, K., Hamari, J., 2012. Defining gamification: : a service marketing perspective, in: Proceeding of the 16th International Academic MindTrek Conference on - MindTrek '12. ACM Press, New York, New York, USA, p. 17. doi:10.1145/2393132.2393137

Kultima, A., 2015. Defining Game Jam, in: 10th Foundations of Digital Games Conference (FDG 2015).

Mader, M.M., 2015. Innovative Engagement with NASA Data: Best Practices in Hosting a Space-Themed Game Jam Event. Am. Geophys. Union, Fall Meet. 2015, Abstr. #ED51B-0817.

Murphy, L.B., 2007. ICOM Statutes - The Definition of the Museum.

Musil, J., Schweda, A., Winkler, D., Biffl, S., 2010. Synthesized essence: what game jams teach about prototyping of new software products, in: Proceedings of the 32nd ACM/IEEE International Conference on Software Engineering - ICSE '10. ACM Press, New York, New York, USA, p. 183. doi:10.1145/1810295.1810325

Preston, J.A., Chastine, J., O'Donnell, C., Tseng, T., MacIntyre, B., Berland, M., Lee, V.R., Claypool, K., Claypool, M., Gestwicki, P., Sun, F.S., Dean, B., Zagal, J.P., Rick, J., Hsi, I., 2012. Game Jams. Int. J. Game-Based Learn. 2, 51–70. doi:10.4018/ijgbl.2012070104

Roussou, M., Pujol, L., Katifori, A., Chrysanthi, A., Perry, S.E., Vayanou, M., 2015. The museum as digital storyteller: Collaborative participatory creation of interactive digital experiences, in: Museums and the Web.

Scott, M., Ghinea, G., 2013. Promoting Game Accessibility: Experiencing an Induction on Inclusive Design Practice at the Global Games Jam, in: Proceedings of the Inaugural Workshop on the Global Games Jam.

Seaborn, K., Fels, D.I., 2015. Gamification in theory and action: A survey. Int. J. Hum. Comput. Stud. 74, 14–31. doi:10.1016/j.ijhcs.2014.09.006

Siemens, G., 2014. Connectivism: A Learning Theory for the Digital Age.

Simon, N., 2016. The Art of Relevance. Museum 2.0.

Tallon, L., Walker, K., 2008. Digital Technologies and the Museum Experience : Handheld Guides and Other Media. AltaMira, Lanham.

Walz, S.P., Deterding, S., 2015. The gameful world : approaches, issues, applications. MIT Press.

Wolf, M., Lee, E., Borchers, J., 2007. Education, entertainment and authenticity, in: CHI '07 Extended Abstracts on Human Factors in Computing Systems - CHI '07. ACM Press, New York, New York, USA, p. 1887. doi:10.1145/1240866.1240916